



**Quad E1/T1 Card
For
AM3440-A/B/C
USER'S MANUAL**

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1. PRODUCT INTRODUCTION

1.1 Description

Loop Telecom's QT1/QE1 plug-in cards are a series of 2 different plug-in cards designed for the Loop-AM3440 series. They allow each DS0 time slot in QT1 or QE1 interfaces to be interchanged and multiplexed onto a digital network.

Continuous error checking, performance polling, and in-service diagnostics are provided through the main controller of the Loop-AM3440 series. In addition, an LED on the plug-in provides status indication.

1.2 Specification

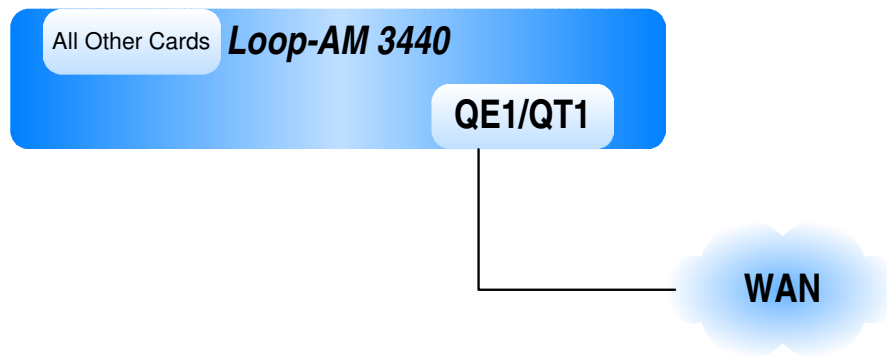
Network Line Interface (QT1)

Line Rate	1.544 Mbps $\pm$ 32 ppm	Framing	D4/ESF
Line Code	AMI/B8ZS	Connector	RJ48C
Input Signal	DSX-1 0dB to -30dB w/ALBO	Output Signal	DSX-1 w/0, -7.5, -15 dB LBO
Jitter	AT&T TR 62411	Pulse Template	AT&T TR 62411
Data Rate	n * (64) Kbps (n=1-24)		
Surge Protection	FCC Part 68 Sub Part D		

Network Line Interface (QE1)

Line Rate	2.048 Mbps $\pm$ 50 ppm	Framing	ITU G.704
Line Code	AMI/HDB3	Connector	RJ48C or BNC
Input Signal	ITU G.703	Output Signal	ITU G.703
Jitter	ITU G.823	Electrical	75 Ω coax/120 Ω twisted pair
Data Rate	n * (64) Kbps (n = 1 - 32)		

1.3 Application Illustration



2. INSTALLATION

2.1 Site Selection

The following list indicates a site selection guideline. Users need to follow this guideline to select a proper installation site.

- Location of the Rack should be part of the central office equipment layout design. Considerations should be given to entrance cable routing and -48 Vdc power.
- The installation site should have -48 Vdc power. An optional AC/DC power converter can be used. Use Only with Class 2 power source, -48 Vdc, 100 watts.

2.2 Mechanical Installation

The Quad E1/T1 card is designed to be plugged into any of the available slots from 1 to 12 in the Loop-AM3440 devices. The 4E1 card supports RJ48C connector or BNC connector, and 4T1 card supports RJ48C connecotr only. The front panel is shown in the following figure.

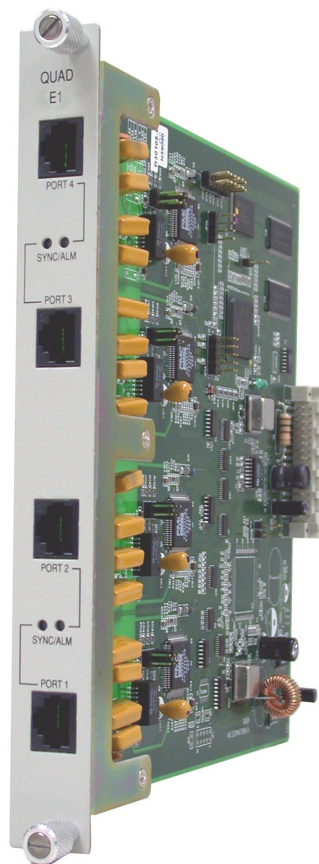


Figure 2-1 Quad E1 Card with RJ48C Connector

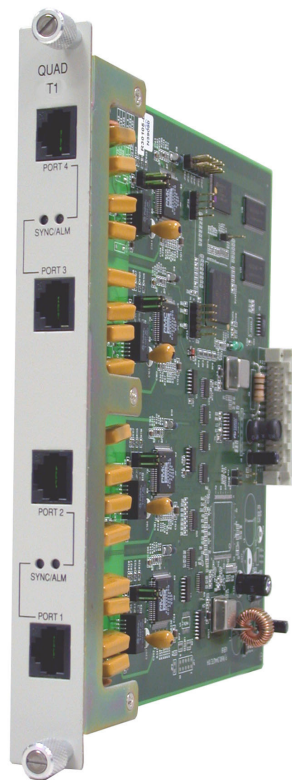


Figure 2-2 Quad T1 Card with RJ48C Connector



Figure 2-3 Quad E1 Card with BNC Connector

2.2 LED Indication

The front of the Loop-AM 3440 has LEDs for operation and error indications. The indication can be in one or more colors. Note that when powering up and self test is in progress, the unit front panel LEDs are also used to indicate fault conditions.

Table 2-1 LED Indication

LED	Color	Indication
SYNC/ALM (One per port)	Off	No signal or port not equipped
	Green	Normal, 4E1/ T1 interface in sync In master mode (as protection function is enable)
	Flashing Green	4E1/ T1 interface loopback test in progress
	Red	Alarm, 4E1/ T1 interface is unsync
	Flashing Red Flashing Green slowly	Receive RAI In slave mode (as protection function is enable)

2.3 Pin Definition

Table 2-2 QE1/T1 Pin Definition

Pin Number	Signal	Signal Description
1	Receive Tip	From T1/E1 Network
2	Receive Ring	From T1/E1 Network
3	Unassigned	
4	Transmit Tip	To T1/E1 Network
5	Transmit Ring	To T1/E1 Network
6	Unassigned	
7	Chassis Ground	
8	Chassis Ground	

2.4 Jumper Setting

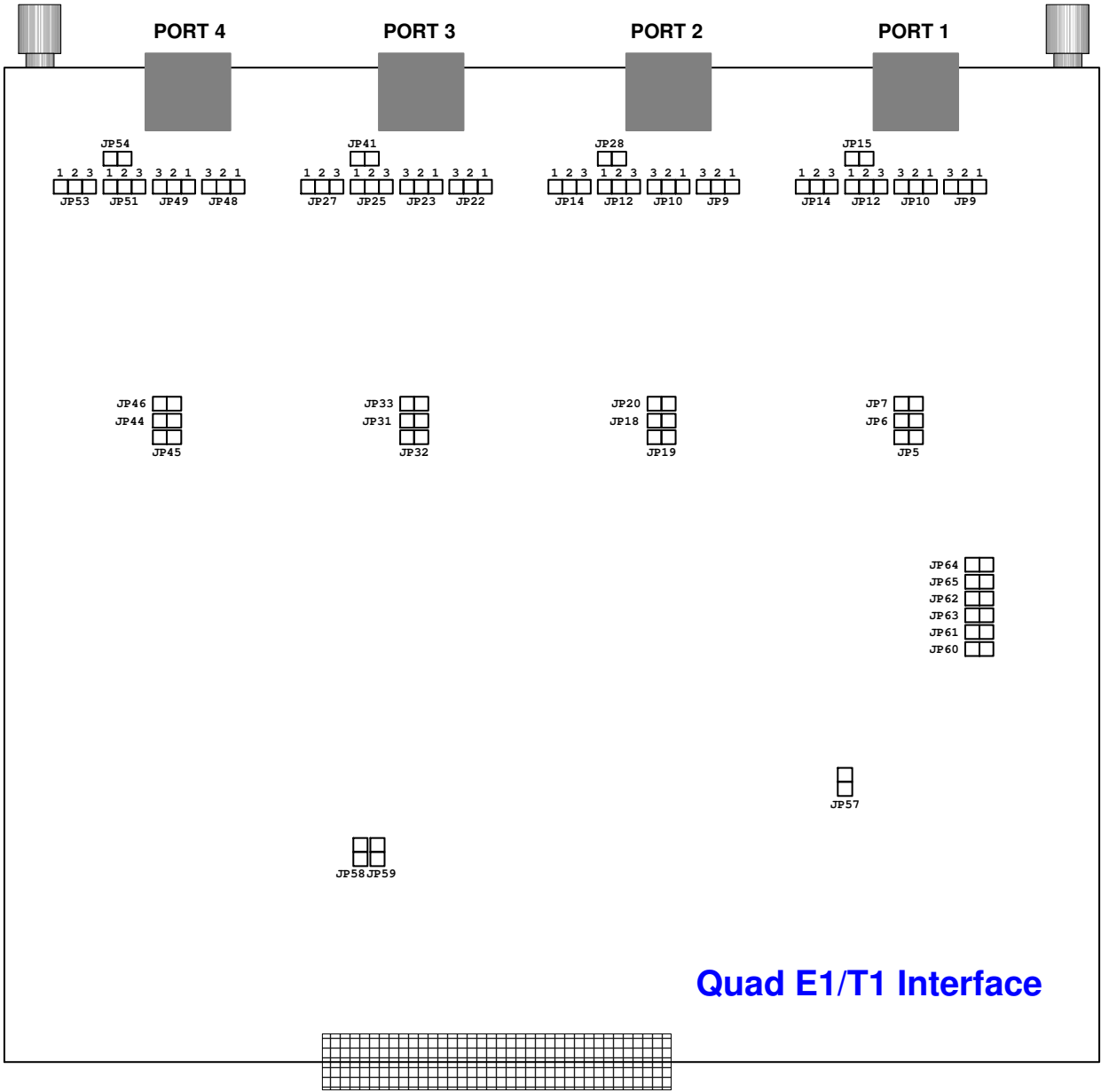


Figure 2- 1 Jumper Location for Quad E1/ T1 Interface

Table 2-3 Jumper Setting for Quad E1/ T1 Interface

	Jumper	RJ	BNC	GND	120 Ω	75 Ω	100 Ω	E1	T1	Circuit Protection
For Port 4	9	2, 3 ON	1, 2 ON							
	10	2, 3 ON	1, 2 ON							
	12	2, 3 ON	1, 2 ON							
	14	2, 3 ON	1, 2 ON							
	15			ON						
	5				ON					OFF
	6					ON				OFF
	7						ON			OFF
	58							OFF	ON	
	59				OFF	ON				
For Port 3	22	2, 3 ON	1, 2 ON							
	23	2, 3 ON	1, 2 ON							
	25	2, 3 ON	1, 2 ON							
	27	2, 3 ON	1, 2 ON							
	28			ON						
	18				ON					OFF
	19					ON				OFF
	20						ON			OFF
	60							OFF	ON	
	61				OFF	ON				
For Port 2	35	2, 3 ON	1, 2 ON							
	36	2, 3 ON	1, 2 ON							
	38	2, 3 ON	1, 2 ON							
	40	2, 3 ON	1, 2 ON							
	41			ON						
	31				ON					OFF
	32					ON				OFF
	33						ON			OFF
	62							OFF	ON	
	63				OFF	ON				
For Port 1	48	2, 3 ON	1, 2 ON							
	49	2, 3 ON	1, 2 ON							
	51	2, 3 ON	1, 2 ON							
	53	2, 3 ON	1, 2 ON							
	54			ON						
	44				ON					OFF
	45					ON				OFF
	46						ON			OFF
	64							OFF	ON	
	65				OFF	ON				
For Bank Change	57	When jumper 57 is on, bank will be changed after rebooting the system.								

3. SYSETM SETUP: Quad E1 Card

NOTE: The terminal operations for Quad E1 and Quad T1 are same. Only the content information for "Unit System Setup" of Quad T1 is different from Quad E1.

Under the Controller Menu, press "U" to choose a slot for Quad E1 port. The screen will show as below. Then press "P" to choose E1 port, press ENTER to get into the port menu.

```
SLOT 11 Quad-E1 PORT 1          === Port Menu ===          14:48:30 09/30/2003

Version      : SW S1.E0 09/22/2003

[DISPLAY]
1 -> Unit 1-Hour Perf. Report
2 -> Unit 24-Hour Perf. Report
A -> Unit Line Availability
C -> Unit Configuration
I -> Unit Status
H -> Unit Alarm History
Q -> Unit Alarm Queue

[LOG]
U -> Choose Other Slot
P -> Choose E1 Port
F -> Log Off [SETUP],[MISC] Menu
O -> Log On  [SETUP],[MISC] Menu
E -> Return to Controller Main Menu
Port : 02

[SETUP]
L -> Unit Loopback Setup
S -> Unit System Setup
K -> Unit Clear Performance Data
M -> Unit Alarm Setup
X -> Unit Clear Alarm Queue & History
D -> Unit Upgrade Firmware

[MISC]
Y -> Unit Load Default Config
Z -> Unit Reset

>> Please input E1 Port (1-4), then press ENTER
```

This port menu is for Quad E1 Port 2.

```
SLOT 11 Quad-E1 PORT 2          === Port Menu ===          14:48:40 09/30/2003

Version      : SW S1.E0 09/22/2003

[DISPLAY]
1 -> Unit 1-Hour Perf. Report
2 -> Unit 24-Hour Perf. Report
A -> Unit Line Availability
C -> Unit Configuration
I -> Unit Status
H -> Unit Alarm History
Q -> Unit Alarm Queue

[LOG]
U -> Choose Other Slot
P -> Choose E1 Port
F -> Log Off [SETUP],[MISC] Menu
O -> Log On  [SETUP],[MISC] Menu
E -> Return to Controller Main Menu

[SETUP]
L -> Unit Loopback Setup
S -> Unit System Setup
K -> Unit Clear Performance Data
M -> Unit Alarm Setup
X -> Unit Clear Alarm Queue & History
D -> Unit Upgrade Firmware

[MISC]
Y -> Unit Load Default Config
Z -> Unit Reset

>>SPACE bar to refresh or enter a command ==>
```

3.1 Unit 1-Hour Performance Report

Press "1" from Port Menu to view the 1-hour performance report. Use TAB key to select register type, USER or LINE. The current selection will be highlighted by an asterisk (*).

```

SLOT 11 Quad-E1 PORT 2=== Port 1-Hour Perf. Report ===      14:48:50 09/30/2003

>> Select Register Type ? *USER  LINE

```

After pressing ENTER from the above screen, the following screen will show up.

```

SLOT 11 Quad-E1 PORT 2=== Port 1-Hour Perf. Report ===      14:49:02 09/30/2003
USER
-- Valid Seconds in Current 15-Min Interval : 833 seconds
      (ES)      (UAS)      (BES)      (SES)      (DM)      (CSS)
Current 15-Min Interval      : 0          833      0          0          0          140
1st Nearest 15-Min Interval : 0          900      0          0          0          150
2nd Nearest 15-Min Interval : 0          900      0          0          0          151
3rd Nearest 15-Min Interval : 0          900      0          0          0          151
4th Nearest 15-Min Interval : 0           0        0          0          0           0

-- Valid 15-Min Intervals in Current 24-Hour Interval: 20
      (ES)      (UAS)      (BES)      (SES)      (DM)      (CSS)
Current 24-Hour Interval      : 0         18000      0          0          0          255
09/29/2003                    : -----
09/28/2003                    : -----
09/27/2003                    : -----
09/26/2003                    : -----
09/25/2003                    : -----
09/24/2003                    : -----
09/23/2003                    : -----

<< TAB key to show Statistics Report >>
<< ESC key to return to previous menu, SPACE bar to refresh >>

```

3.2 Unit 24-Hour Performance Report

Press “2” from Port Menu to view the 24-hour performance report. Use TAB key to select register type, USER or LINE, press ENTER. Then move the cursor to select the desired parameter. The current selection will be highlighted by an asterisk (*).

```
SLOT 11 Quad-E1 PORT 2=== Port 24-Hour Perf. Report ===      14:49:26 09/30/2003

>> Select Register Type ? *USER  LINE
>> Select Parameter ? *ES  UAS  BES  SES  CSS  DM  AS  EFS  BPV
```

After pressing ENTER from the above screen, the following screen will show up.

```
SLOT 11 Quad-E1 PORT 2=== Port 24-Hour Perf. Report ===      14:49:38 09/30/2003
USER ES
-- Valid Seconds in Current 15-Min Interval : 869 seconds
-- Valid 15-Min Intervals in Current 24-Hour Interval: 20
      (ES)      (UAS)      (BES)      (SES)      (DM)      (CSS)
Current 15-Min Interval      : 0      869      0      0      0      146
Current 24-Hour Interval      : 0      18000      0      0      0      255

-- USER, ES, Last 96 15-Min Interval :
01-08 > 0      0      0      0      0      0      0
09-16 > 0      0      0      0      0      0      0
17-24 > 0      0      0      0      0      0      0
25-32 > -----
33-40 > -----
41-48 > -----
49-56 > -----
57-64 > -----
65-72 > -----
73-80 > -----
81-88 > -----
89-96 > -----

<< TAB key to show Statistics Report >>
<< ESC key to return to previous menu, SPACE bar to refresh >>
```

3.3 Unit Line Availability

Under Port Menu, press “A” to view the line availability as the following screen shows.

```

SLOT 11 Quad-E1 PORT 2   === Port Line Availability ===      14:49:46 09/30/2003

-- Line Availability during Last 24-Hour:
Valid Seconds      : 18877 seconds
Available Seconds  : 0 seconds
Unavailable Seconds: 18877 seconds
Line Availability   : 0.0 %

<< ESC key to return to previous menu, SPACE bar to refresh >>

```

3.4 Unit Configuration

To view the unit configuration, press “C” from Port Menu, then the screen will show as below. There are four options are available for FDL item: OFF, SSM, FDL, and HDLC.

```

SLOT 11 Quad-E1 PORT 2   === Port System Setup ===          14:49:53 09/30/2003

FRAME      = ON
CODE       = HDB3
CRC        = ON
RAI        = ON
AIS        = FRAMED
CAS        = OFF
SIGNALLING= TRANS
CGA        = NORM
OOS        = BUSY
FDL        = OFF
Sa_bit     = Sa4
IDLE       = D5
Protected  = DISABLE
Master     = ****
INTF       = 120 Ohm

<< ESC key to return to previous menu, SPACE bar to refresh >>

```

Note: FDL can be enabled in a maximum of 2 ports.

3.5 Unit Status

Press “I” from Port Menu, to show the screen of Unit Status as below. All of the following plug-in cards support remote link identification: DTU-6, DTU-10, HDSL, G. SHDSL-2, G. SHDSL-4, E1, QE1, and MiniQE1.

```

SLOT 11 Quad-E1 PORT 2      === Port Status ===      14:50:03 09/30/2003

-- LINE --
  LOS      : YES
  LOF      : LOF
  RCV AIS  : NO
  RCV RAI  : NO
  XMT AIS  : NO
  XMT RAI  : RAI
  BPV ERROR COUNT : 0
  ES ERROR COUNT : 0

-- TEST --
  PATTERN TRANSMITTED : OFF
  NEAR-END LOOPBACK   : OFF

-- REMOTE LINK IDENTIFICATION --
  TYPE:      CPE
  SERIAL_NO  : 26224

<< ESC key to return to previous menu, SPACE bar to refresh >>

```

3.6 Unit Alarm History

To view the unit alarm history, press “H” from Port Menu.

```

SLOT 11 Quad-E1 PORT 2      === Port Alarm History ===      14:50:11 09/30/2003
LOCAL
[ALARM-TYPE]    [THRESHOLD]    [CURR-STATE]    [COUNT]    [ALARM]
RAI              DISABLE      0              DISABLE
AIS              DISABLE      0              DISABLE
LOS              DISABLE      0              DISABLE
LOF              DISABLE      0              DISABLE
BPV              10E-5        DISABLE      0              DISABLE
ES               1            DISABLE      0              DISABLE
UAS              1            DISABLE      0              DISABLE
CSS              1            DISABLE      0              DISABLE

<< ESC key to return to previous menu, SPACE bar to refresh >>

```

3.7 Unit Alarm Queue

Under Port Menu, press “Q” to view the alarm queue as the following screen shows.

```
SLOT 11 Quad-E1 PORT 2      === Unit Alarm Queue ===      14:50:19 09/30/2003
 1 -- Slot 11: E1#1   ES   remove-----11:18:34 09/30/2003
 2 -- Slot 11: E1#1   ES   -----11:18:33 09/30/2003
 3 -- Slot 11: E1#1   CSS remove-----10:53:01 09/30/2003
 4 -- Slot 11: E1#1   CSS-----10:52:59 09/30/2003
 5 -- Slot 11: E1#1   UAS remove-----10:52:59 09/30/2003
 6 -- Slot 11: E1#1   UAS-----10:52:58 09/30/2003
```

<< ESC key return to previous menu or SPACE bar to refresh >>

3.8 Unit Loopback Setup

Under Port Menu, press “L” to do Loopback Test, then the screen will show as below. Use arrow keys to move the cursor, press ENTER key to select items.

```
SLOT 11 Quad-E1 PORT 2      === Port Loopback Test ===      14:50:32 09/30/2003
ARROW KEYS : CURSOR MOVE , ENTER KEY : ITEM SELECT

- NEAR-END LOOPBACK      : *OFF  LOCAL  PLB  LLB

- SEND LOOPBACK ACTIVATE CODE TO FAR-END:
  *PAYLOAD  LINE
- SEND LOOPBACK DEACTIVATE CODE TO FAR-END:
  *PAYLOAD  LINE
- SEND TEST PATTERN:
  *OFF  PRBS-FULL
```

- STATUS:

<< Press ESC key to return to previous menu >>

3.9 Unit System Setup

To set up unit system, press “S” from Port Menu, then the following screen will show up. Use arrow keys to move the cursor, TAB key to roll up options.

NOTE: If "Protected" is set as DISABLE, then "Master" option will show 4 asterisks (****), which means this option is not allowed to set up.

For Quad E1:

```
SLOT 11 Quad-E1 PORT 2      === Port System Setup ===      14:50:39 09/30/2003
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS
```

```

FRAME      = ON
CODE       = HDB3
CRC        = ON
RAI        = ON
AIS        = FRAMED
CAS        = OFF
SIGNALLING= TRANS
CGA        = NORM
OOS        = BUSY
FDL        = OFF
Sa_bit     = Sa4
IDLE       = D5
Protected  = DISABLE
Master     = ****
INTF       = 120 Ohm
```

```
<< Press ESC key to return to previous menu >>
```

Note:

For detailed description for each function, see Appendix C: System Port Setup Configuration

Configuration	Option	Default
Frame	ON, OFF	ON
CODE	HDB3, AMI	HDB3
CRC (Cyclic Redundancy Check)	ON, OFF	ON
RAI (Remote Alarm Indication)	ON, OFF	ON
AIS (Alarm Indication Signal)	FRAMED, UNFRAMED, OFF	FRAMED
CAS (Channel Associated Signaling)	ON, OFF	OFF
SIGNALLING	TRANS, CD=01	TRANS
CGA (Carrier Group Alarm)	NORM	NORM
OOS (Out of Service)	BUSY, IDLE, AIS	BUSY
FDL (Facility Data Lock)	OFF, HDLC, SSM, FDL	OFF
Sa-bit	Sa4, Sa5, Sa6, Sa7, Sa8, Sa4+Sa5	Sa4
IDLE	00-FF	D5

For Quad T1:

```
SLOT 1 Quad-T1 PORT 1      === Port System Setup ===      11:08:45 08/30/2004
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS
```

```
FRAME      = ESF
CODE       = B8ZS
YEL        = ON
AIS        = FRAMED
CAS        = OFF
SIGNALLING= TRANS
CGA        = NORM
OOS        = BUSY
INBAND     = OFF
IDLE       = FF
INTF       = LONG HAUL
LBO        = 0 dB
FDL        = FDL
Protected  = DISABLE
Master     = ****
```

```
<< Press ESC key to return to previous menu >>
```

3.10 Unit Clear Performance Data

Press “K” from Port Menu to clear performance data, the screen will show as below. Press “Y” or “N” to confirm the command.

```

SLOT 11 Quad-E1 PORT 2          === Port Menu ===          14:50:45 09/30/2003

Version      : SW S1.E0 09/22/2003

[DISPLAY]
1 -> Unit 1-Hour Perf. Report
2 -> Unit 24-Hour Perf. Report
A -> Unit Line Availability
C -> Unit Configuration
I -> Unit Status
H -> Unit Alarm History
Q -> Unit Alarm Queue

[SETUP]
L -> Unit Loopback Setup
S -> Unit System Setup
K -> Unit Clear Performance Data
M -> Unit Alarm Setup
X -> Unit Clear Alarm Queue & History
D -> Unit Upgrade Firmware

[LOG]
U -> Choose Other Slot
P -> Choose E1 Port
F -> Log Off [SETUP],[MISC] Menu
O -> Log On  [SETUP],[MISC] Menu
E -> Return to Controller Main Menu

[MISC]
Y -> Unit Load Default Config
Z -> Unit Reset

==> Clear performance data - are you sure [Y/N] ?

```

3.11 Unit Alarm Setup

To do alarm setup, press “M” from Port Menu, then the following screen will show up.

```

SLOT 11 Quad-E1 PORT 2          === Port Alarm Setup ===    14:50:59 09/30/2003
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS

[TYPE]      [THRESHOLD] [ALARM]
RAI          DISABLE
AIS          DISABLE
LOS          DISABLE
LOF          DISABLE
BPV          10E-5      DISABLE
ES           001        DISABLE
UAS           001        DISABLE
CSS           001        DISABLE

<< Press ESC key to return to previous menu >>

```

3.12 Unit Clear Alarm Queue & History

Under Port Menu, press “X” to clear alarm queue and history, then press “Y” or “N” to confirm it.

```

SLOT 11 Quad-E1 PORT 2          === Port Menu ===          14:51:05 09/30/2003

Version      : SW S1.E0 09/22/2003

[DISPLAY]
1 -> Unit 1-Hour Perf. Report
2 -> Unit 24-Hour Perf. Report
A -> Unit Line Availability
C -> Unit Configuration
I -> Unit Status
H -> Unit Alarm History
Q -> Unit Alarm Queue

[SETUP]
L -> Unit Loopback Setup
S -> Unit System Setup
K -> Unit Clear Performance Data
M -> Unit Alarm Setup
X -> Unit Clear Alarm Queue & History
D -> Unit Upgrade Firmware

[LOG]
U -> Choose Other Slot
P -> Choose E1 Port
F -> Log Off [SETUP],[MISC] Menu
O -> Log On  [SETUP],[MISC] Menu
E -> Return to Controller Main Menu

[MISC]
Y -> Unit Load Default Config
Z -> Unit Reset

>> Clear alarm queue of SLOT 11 - are you sure ? [Y/N]

```

3.13 Unit Upgrade Firmware

Press “D” to download firmware, then the screen will show as below. Use arrow keys to move the cursor and SPACE key to edit.

```

LOOP AM3440-A          === Download Firmware ===          14:51:21 09/30/2003
ARROW KEYS: CURSOR MOVE, Please Input: nnn.nnn.nnn.nnn, BACKSPACE to edit

Bank 1 Firmware Ver. : S1.E0 09/22/2003          (Bad)
Bank 2 Firmware Ver. : S1.E0 09/22/2003          (Bad)
Working Firmware Bank: 1
TFTP Server IP       : 000.000.000.000
Firmware File Name   :

<< Press ESC key to return to previous menu >>

```

3.14 Unit Load Default Configuration

Press “Y” to return to default, then confirm it by pressing “Y” or “N”.

```

SLOT 11 Quad-E1 PORT 2          === Port Menu ===          14:51:29 09/30/2003

Version      : SW S1.E0 09/22/2003

[DISPLAY]
1 -> Unit 1-Hour Perf. Report
2 -> Unit 24-Hour Perf. Report
A -> Unit Line Availability
C -> Unit Configuration
I -> Unit Status
H -> Unit Alarm History
Q -> Unit Alarm Queue

[SETUP]
L -> Unit Loopback Setup
S -> Unit System Setup
K -> Unit Clear Performance Data
M -> Unit Alarm Setup
X -> Unit Clear Alarm Queue & History
D -> Unit Upgrade Firmware

[LOG]
U -> Choose Other Slot
P -> Choose E1 Port
F -> Log Off [SETUP],[MISC] Menu
O -> Log On  [SETUP],[MISC] Menu
E -> Return to Controller Main Menu

[MISC]
Y -> Unit Load Default Config
Z -> Unit Reset

>> Return to default - are you sure ? [Y/N]

```

Note: When you load the default configuration, the current daughter card map will not be cleared.

3.15 Unit Reset

Under Port Menu, press “Z” to reset unit. Press “Y” or “N” to confirm it.

```

SLOT 11 Quad-E1 PORT 2          === Port Menu ===          14:51:29 09/30/2003

Version      : SW S1.E0 09/22/2003

[DISPLAY]
1 -> Unit 1-Hour Perf. Report
2 -> Unit 24-Hour Perf. Report
A -> Unit Line Availability
C -> Unit Configuration
I -> Unit Status
H -> Unit Alarm History
Q -> Unit Alarm Queue

[SETUP]
L -> Unit Loopback Setup
S -> Unit System Setup
K -> Unit Clear Performance Data
M -> Unit Alarm Setup
X -> Unit Clear Alarm Queue & History
D -> Unit Upgrade Firmware

[LOG]
U -> Choose Other Slot
P -> Choose E1 Port
F -> Log Off [SETUP],[MISC] Menu
O -> Log On  [SETUP],[MISC] Menu
E -> Return to Controller Main Menu

[MISC]
Y -> Unit Load Default Config
Z -> Unit Reset

Reset - are you sure ? [Y/N]

```

4. SYSTEM SETUP: Quad T1 Card

Under the Controller Menu, press “U” to choose a slot for Quad T1 card. The screen will show as below.

```

SLOT 1 Quad-T1 PORT 1          === Port Menu ===          15:39:50 11/17/2010

Version      : SW V3.03.01 10/29/2010

[DISPLAY]
1 -> Unit 1-Hour Perf. Report
2 -> Unit 24-Hour Perf. Report
A -> Unit Line Availability
C -> Unit Configuration
I -> Unit Status
H -> Unit Alarm History
Q -> Unit Alarm Queue
V -> Customer Information Display

[SETUP]
L -> Unit Loopback Setup
S -> Unit System Setup
K -> Unit Clear Performance Data
M -> Unit Alarm Setup
X -> Unit Clear Alarm Queue & History
D -> Unit Upgrade Firmware
T -> Customer Information Setup

[LOG]
U -> Choose Other Slot
P -> Choose E1/T1 Port
F -> Log Off [SETUP],[MISC] Menu
O -> Log On  [SETUP],[MISC] Menu
E -> Return to Controller Main Menu

[MISC]
Y -> Unit Load Default Config
Z -> Unit Reset

>>SPACE bar to refresh or enter a command ==>

```

Then press “P” to choose an T1 port, a prompt will show at the bottom of the screen as below. Press ENTER to get into the port menu.

```

Port : 01
>> Please input Port Number (1~4), then press ENTER .

```

This port menu is for Quad T1 Port 1.

```

SLOT 1 Quad-T1 PORT 1          === Port Menu ===          15:42:47 11/17/2010

Version      : SW V3.03.01 10/29/2010

[DISPLAY]
1 -> Unit 1-Hour Perf. Report
2 -> Unit 24-Hour Perf. Report
A -> Unit Line Availability
C -> Unit Configuration
I -> Unit Status
H -> Unit Alarm History
Q -> Unit Alarm Queue
V -> Customer Information Display

[SETUP]
L -> Unit Loopback Setup
S -> Unit System Setup
K -> Unit Clear Performance Data
M -> Unit Alarm Setup
X -> Unit Clear Alarm Queue & History
D -> Unit Upgrade Firmware
T -> Customer Information Setup

[LOG]
U -> Choose Other Slot
P -> Choose E1/T1 Port
F -> Log Off [SETUP],[MISC] Menu
O -> Log On  [SETUP],[MISC] Menu
E -> Return to Controller Main Menu

[MISC]
Y -> Unit Load Default Config
Z -> Unit Reset

>>SPACE bar to refresh or enter a command ==>

```

4.1 Unit 1-Hour Performance Report

Press “1” from Port Menu to view the 1-hour performance report. Use TAB key to select register type, USER or LINE. The current selection will be highlighted by an asterisk (*).

```
SLOT 1 Quad-T1 PORT 1 === Port 1-Hour Perf. Report === 15:44:18 11/17/2010
```

```
>> Select Register Type ? *USER  LINE
```

After pressing ENTER from the above screen, the following screen will show up.
Sample screen for USER:

```
SLOT 1 Quad-T1 PORT 1 === Port 1-Hour Perf. Report === 15:44:53 11/17/2010
USER
```

```
-- Valid Seconds in Current 15-Min Interval : 1051 seconds
      (ES)   (UAS)   (BES)   (SES)   (CSS)   (LOFC)
Current 15-Min Interval      : 1046   0       543   503   66   0
1st Nearest 15-Min Interval : 961    0       873   88   196   0
2nd Nearest 15-Min Interval : 342    668    265   77   32   0
3rd Nearest 15-Min Interval : 9      78     2     7    2    1
4th Nearest 15-Min Interval : -----
```

```
-- Valid 15-Min Intervals in Current 24-Hour Interval: 3
      (ES)   (UAS)   (BES)   (SES)   (CSS)   (LOFC)
Current 24-Hour Interval    : 1312   746   1140   172   230   1
```

```
<< TAB key to show Statistics Report >>
```

```
<< ESC key to return to previous menu, SPACE bar to refresh >>
```

Sample screen for LINE:

```
SLOT 1 Quad-T1 PORT 1          === Port 1-Hour Perf. Report === 15:45:18 11/17/2010
LINE
```

```
-- Valid Seconds in Current 15-Min Interval : 21 seconds
      (ES)   (UAS)   (BES)   (SES)   (CSS)   (LOFC)
Current 15-Min Interval      : 21     0       8    13    0    0
1st Nearest 15-Min Interval : 1054   0       545   509   66   0
2nd Nearest 15-Min Interval : 961    0       873   88   196   0
3rd Nearest 15-Min Interval : 342    668    265   77   32   0
4th Nearest 15-Min Interval : 9      78     2     7    2    1
```

```
-- Valid 15-Min Intervals in Current 24-Hour Interval: 4
      (ES)   (UAS)   (BES)   (SES)   (CSS)   (LOFC)
Current 24-Hour Interval    :
```

```
<< TAB key to show Statistics Report >>
```

```
<< ESC key to return to previous menu, SPACE bar to refresh >>
```

4.2 Unit 24-Hour Performance Report

Press “2” from Port Menu to view the 24-hour performance report. Use TAB key to select register type, USER or LINE, press ENTER. Then move the cursor to select the desired parameter. The current selection will be highlighted by an asterisk (*).

```

SLOT 1 Quad-T1 PORT 1 === Port 24-Hour Perf. Report ===      15:48:12 11/17/2010

>> Select Register Type ? *USER  LINE
>> Select Parameter ? *ES  UAS  BES  SES  CSS  LOFC  AS  EFS  BPV  ESF

```

After pressing ENTER from the above screen, the following screen will show up.

```

SLOT 11 Quad-E1 PORT 2=== Port 24-Hour Perf. Report ===      14:49:38 09/30/2003
USER ES
-- Valid Seconds in Current 15-Min Interval : 869 seconds
-- Valid 15-Min Intervals in Current 24-Hour Interval: 20
      (ES)      (UAS)      (BES)      (SES)      (DM)      (CSS)
Current 15-Min Interval      : 0      869      0      0      0      146
Current 24-Hour Interval      : 0      18000      0      0      0      255

-- USER, ES, Last 96 15-Min Interval :
01-08 > 0      0      0      0      0      0      0      0
09-16 > 0      0      0      0      0      0      0      0
17-24 > 0      0      0      0      0      0      0      0
25-32 > -----
33-40 > -----
41-48 > -----
49-56 > -----
57-64 > -----
65-72 > -----
73-80 > -----
81-88 > -----
89-96 > -----

<< TAB key to show Statistics Report >>
<< ESC key to return to previous menu, SPACE bar to refresh >>

```

4.3 Unit Line Availability

Under Port Menu, press “A” to view the line availability as the following screen shows.

```

LOT 1 Quad-T1 PORT 1      === Port Line Availability ===      15:48:51 11/17/2010

-- Line Availability during Last 24-Hour:
Valid Seconds      : 3876 seconds
Available Seconds  : 3130 seconds
Unavailable Seconds: 746 seconds
Line Availability   : 80.75 %

<< ESC key to return to previous menu, SPACE bar to refresh >>

```

4.4 Unit Configuration

To view the unit configuration, press “C” from Port Menu, then the screen will show as below. There are four options are available for FDL item: OFF, SSM, FDL, and HDLC.

```

SLOT 1 Quad-T1 PORT 1      === Port System Setup ===      15:49:12 11/17/2010

FRAME      = ESF
CODE       = B8ZS
YEL        = ON
AIS        = FRAMED
CAS        = OFF
SIGNALLING= TRANS
CGA        = NORM
OOS        = BUSY
INBAND     = OFF
IDLE       = FF
INTF       = LONG HAUL
LBO        = 0 dB
FDL        = OFF
Protected  = DISABLE
Master     = ****

<< ESC key to return to previous menu, SPACE bar to refresh >>

```

Note: FDL can be enabled in a maximum of 2 ports.

4.5 Unit Status

Press “I” from Port Menu, to show the screen of Unit Status as below.

```

SLOT 1 Quad-T1 PORT 1      === Port Status ===      15:49:31 11/17/2010

-- LINE --
  LOS      : NO
  LOF      : NO
  RCV AIS  : NO
  RCV YEL  : NO
  XMT AIS  : NO
  XMT YEL  : NO
  BPV ERROR COUNT : 65535
  ES  ERROR COUNT : 323

-- TEST --
  PATTERN TRANSMITTED : OFF
  NEAR-END LOOPBACK   : OFF

<< ESC key to return to previous menu, SPACE bar to refresh >>

```

4.6 Unit Alarm History

To view the unit alarm history, press “H” from Port Menu.

```

SLOT 1 Quad-T1 PORT 1      === Port Alarm History ===      15:50:05 11/17/2010
LOCAL
[ALARM-TYPE]  [THRESHOLD]  [CURR-STATE]  [COUNT]  [ALARM]
YEL                                DISABLE      0      DISABLE
AIS                                DISABLE      0      DISABLE
LOS                                DISABLE      0      DISABLE
LOF                                DISABLE      0      DISABLE
BPV              10E-5      DISABLE      0      DISABLE
ES                1        DISABLE      0      DISABLE
UAS                1        DISABLE      0      DISABLE
CSS                1        DISABLE      0      DISABLE

<< ESC key to return to previous menu, SPACE bar to refresh >>

```

4.7 Unit Alarm Queue

Under Port Menu, press “Q” to view the alarm queue as the following screen shows.

```

SLOT 1 Quad-T1 PORT 1      === Unit Alarm Queue ===      15:50:05 11/17/2010
1 -- Slot 01: T1#1   ES   remove-----11:18:34 09/30/2003
2 -- Slot 01: T1#1   ES   -----11:18:33 09/30/2003
3 -- Slot 01: T1#1   CSS  remove-----10:53:01 09/30/2003
4 -- Slot 01: T1#1   CSS  -----10:52:59 09/30/2003
5 -- Slot 01: T1#1   UAS  remove-----10:52:59 09/30/2003
6 -- Slot 01: T1#1   UAS  -----10:52:58 09/30/2003

<< ESC key return to previous menu or SPACE bar to refresh >>

```

4.8 Customer Information Setup

Under Port Menu, press “V” to view the customer information that relates to each port.

```

SLOT 1 Quad-T1 PORT 1      === Customer Information ===      15:52:51 11/17/2010

P1:
P2:
P3:
P4:

<< ESC key to return to previous menu, SPACE bar to refresh >>

```

4.9 Unit Loopback Setup

Under Port Menu, press “L” to do Loopback Test, then the screen will show as below. Use arrow keys to move the cursor, press ENTER key to select items.

```
SLOT 1 Quad-T1 PORT 1      === Port Loopback Test ===      16:46:35 11/17/2010
ARROW KEYS : CURSOR MOVE , ENTER KEY : ITEM SELECT

- NEAR-END LOOPBACK      : *OFF  LOCAL  PLB  LLB

- SEND LOOPBACK ACTIVATE CODE TO FAR-END:
  *IN-BAND  AT&T-P  ANSI-P  ANSI-L
- SEND LOOPBACK DEACTIVATE CODE TO FAR-END:
  *IN-BAND  AT&T-P  ANSI-P  ANSI-L
- SEND TEST PATTERN:
  *OFF  QRSS-FULL

- STATUS:

<< Press ESC key to return to previous menu >>
```

4.10 Unit System Setup

To set up unit system, press “S” from Port Menu, then the following screen will show up. Use arrow keys to move the cursor, TAB key to roll up options.

NOTE: If "Protected" is set as DISABLE, then "Master" option will show 4 asterisks (****), which means this option is not allowed to set up.

```
SLOT 1 Quad-T1 PORT 1      === Port System Setup ===      16:46:57 11/17/2010
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS

FRAME      = ESF
CODE       = B8ZS
YEL        = ON
AIS        = FRAMED
CAS        = OFF
SIGNALLING= TRANS
CGA        = NORM
OOS        = BUSY
INBAND     = OFF
IDLE       = FF
INTF       = LONG HAUL
LBO        = 0 dB
FDL        = OFF
Protected  = DISABLE
Master     = ****

<< Press ESC key to return to previous menu >>
```

Note:

For detailed description for each function, see Appendix C: System Port Setup Configuration

Configuration	Option	Default
Frame	ESF, ESF&T1,403, None, D4	ESF
CODE	B8ZS, AMI	HDB3
YEL	ON, OFF	ON
AIS (Alarm Indication Signal)	FRAMED, UNFRAMED, OFF	FRAMED
CAS (Channel Associated Signaling)	ON, OFF	OFF
SIGNALLING	TRANS	TRANS
CGA (Carrier Group Alarm)	NORM	NORM
OOS (Out of Service)	BUSY, IDLE, AIS	BUSY
Inband	ON, OFF	OFF
Idle	00-FF	FF
INTF	LONG HAUL SHORT HAUL	LONG HAUL
LBO	0 db, -7.5db, -15db	0 db
FDL (Facility Data Lock)	OFF, FDL	OFF

4.11 Unit Clear Performance Data

Press “K” from Port Menu to clear performance data, the screen will show as below. Press “Y” or “N” to confirm the commend.

```

SLOT 1 Quad-T1 PORT 1      === Port Menu ===      14:50:45 09/30/2003

Version      : SW S1.E0 09/22/2003

[DISPLAY]
1 -> Unit 1-Hour Perf. Report
2 -> Unit 24-Hour Perf. Report
A -> Unit Line Availability
C -> Unit Configuration
I -> Unit Status
H -> Unit Alarm History
Q -> Unit Alarm Queue

[SETUP]
L -> Unit Loopback Setup
S -> Unit System Setup
K -> Unit Clear Performance Data
M -> Unit Alarm Setup
X -> Unit Clear Alarm Queue & History
D -> Unit Upgrade Firmware

[LOG]
U -> Choose Other Slot
P -> Choose E1 Port
F -> Log Off [SETUP],[MISC] Menu
O -> Log On  [SETUP],[MISC] Menu
E -> Return to Controller Main Menu

[MISC]
Y -> Unit Load Default Config
Z -> Unit Reset

==> Clear performance data - are you sure [Y/N] ?

```

4.12 Unit Alarm Setup

To do alarm setup, press “M” from Port Menu, then the following screen will show up.

```

SLOT 1 Quad-T1 PORT 1      === Port Alarm Setup ===      14:50:59 09/30/2003
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS

[TYPE]      [THRESHOLD] [ALARM]
RAI          DISABLE
AIS          DISABLE
LOS          DISABLE
LOF          DISABLE
BPV          10E-5      DISABLE
ES           001        DISABLE
UAS           001        DISABLE
CSS           001        DISABLE

<< Press ESC key to return to previous menu >>

```

4.13 Unit Clear Alarm Queue & History

Under Port Menu, press “X” to clear alarm queue and history, then press “Y” or “N” to confirm it.

```

SLOT 11 Quad-E1 PORT 2          === Port Menu ===          14:51:05 09/30/2003

Version      : SW S1.E0 09/22/2003

[DISPLAY]
1 -> Unit 1-Hour Perf. Report
2 -> Unit 24-Hour Perf. Report
A -> Unit Line Availability
C -> Unit Configuration
I -> Unit Status
H -> Unit Alarm History
Q -> Unit Alarm Queue

[SETUP]
L -> Unit Loopback Setup
S -> Unit System Setup
K -> Unit Clear Performance Data
M -> Unit Alarm Setup
X -> Unit Clear Alarm Queue & History
D -> Unit Upgrade Firmware

[LOG]
U -> Choose Other Slot
P -> Choose E1 Port
F -> Log Off [SETUP],[MISC] Menu
O -> Log On  [SETUP],[MISC] Menu
E -> Return to Controller Main Menu

[MISC]
Y -> Unit Load Default Config
Z -> Unit Reset

>> Clear alarm queue of SLOT 11 - are you sure ? [Y/N]

```

4.14 Unit Upgrade Firmware

Press “D” to download firmware, then the screen will show as below. Use arrow keys to move the cursor and SPACE key to edit.

```

LOOP AM3440-A          === Download Firmware ===          14:51:21 09/30/2003
ARROW KEYS: CURSOR MOVE, Please Input: nnn.nnn.nnn.nnn, BACKSPACE to edit

Bank 1 Firmware Ver. : S1.E0 09/22/2003          (Bad)
Bank 2 Firmware Ver. : S1.E0 09/22/2003          (Bad)
Working Firmware Bank: 1
TFTP Server IP       : 000.000.000.000
Firmware File Name   :

<< Press ESC key to return to previous menu >>

```

4.15 Unit Load Default Configuration

Press “Y” to return to default, then confirm it by pressing “Y” or “N”.

```

SLOT 11 Quad-E1 PORT 2          === Port Menu ===          14:51:29 09/30/2003

Version      : SW S1.E0 09/22/2003

[DISPLAY]
1 -> Unit 1-Hour Perf. Report
2 -> Unit 24-Hour Perf. Report
A -> Unit Line Availability
C -> Unit Configuration
I -> Unit Status
H -> Unit Alarm History
Q -> Unit Alarm Queue

[SETUP]
L -> Unit Loopback Setup
S -> Unit System Setup
K -> Unit Clear Performance Data
M -> Unit Alarm Setup
X -> Unit Clear Alarm Queue & History
D -> Unit Upgrade Firmware

[LOG]
U -> Choose Other Slot
P -> Choose E1 Port
F -> Log Off [SETUP],[MISC] Menu
O -> Log On  [SETUP],[MISC] Menu
E -> Return to Controller Main Menu

[MISC]
Y -> Unit Load Default Config
Z -> Unit Reset

>> Return to default - are you sure ? [Y/N]

```

Note: When you load the default configuration, the current daughter card map will not be cleared.

4.16 Unit Reset

Under Port Menu, press “Z” to reset unit. Press “Y” or “N” to confirm it.

```

SLOT 11 Quad-E1 PORT 2          === Port Menu ===          14:51:29 09/30/2003

Version      : SW S1.E0 09/22/2003

[DISPLAY]
1 -> Unit 1-Hour Perf. Report
2 -> Unit 24-Hour Perf. Report
A -> Unit Line Availability
C -> Unit Configuration
I -> Unit Status
H -> Unit Alarm History
Q -> Unit Alarm Queue

[SETUP]
L -> Unit Loopback Setup
S -> Unit System Setup
K -> Unit Clear Performance Data
M -> Unit Alarm Setup
X -> Unit Clear Alarm Queue & History
D -> Unit Upgrade Firmware

[LOG]
U -> Choose Other Slot
P -> Choose E1 Port
F -> Log Off [SETUP],[MISC] Menu
O -> Log On  [SETUP],[MISC] Menu
E -> Return to Controller Main Menu

[MISC]
Y -> Unit Load Default Config
Z -> Unit Reset

Reset - are you sure ? [Y/N]

```

5 Appendix A – 1:1 Protection for Quad E1 Card

4.1 Introduction

When using 1:1 Protection with Quad E1 cards, two plug-in cards must be inserted next to each other as a pair so that one plug-in card can be used to protect the other.

NOTE: A pair of Quad E1 cards should be installed in one of the following slot groupings: [1&2], [3&4], [5&6], [7&8], [9&10] or [11&12]. The pair of cards should not be installed in the following groupings: [2&3], [4&5], [6&7], [8&9] or [10&11].

NOTE: Before removing any Quad E1 card from AM3440 shelf, please make sure its connecting cables are removed from Quad E1 plug-in card first.

There are two types of protection available for the Quad E1 card. They are Circuit Protection and Line Protection. Circuit Protection requires the use of a Loop-VV Y-BOX. This Y-Box is specifically designed to provide a 1:1 circuit protection function for the Quad E1 card of the Loop-AM 3440 shelf. Line Protection does not require the use of a Y-Box.

Each Quad E1 card has four ports. The ports of one card protect the corresponding ports of the other card. For example, Port 1 of the protection card protects Port 1 of the other card. Similarly, Port 2 of the protection card protects Port 2 of the other card, etc.

4.2 Setting Up Circuit Protection

4.2.1 Connecting the Y-Box to the AM 3440 Shelf

There are two Y-Box types available for the Loop-AM 3440. One has BNC connectors and can handle up to 4 lines. The other has RJ 48C connectors and can handle up to 16 lines. For every four lines you wish to protect you must have one pair of Quad E1 plug-in cards in the Loop-AM 3440.

If you are using the BNC type Y BOX, use BNC cables to connect it to the Loop-AM 3440 as shown in Figure 9-1, below. For illustration purposes, only Port 1 is protected in this sample diagram. To protect other ports you must connect them in a similar manner.

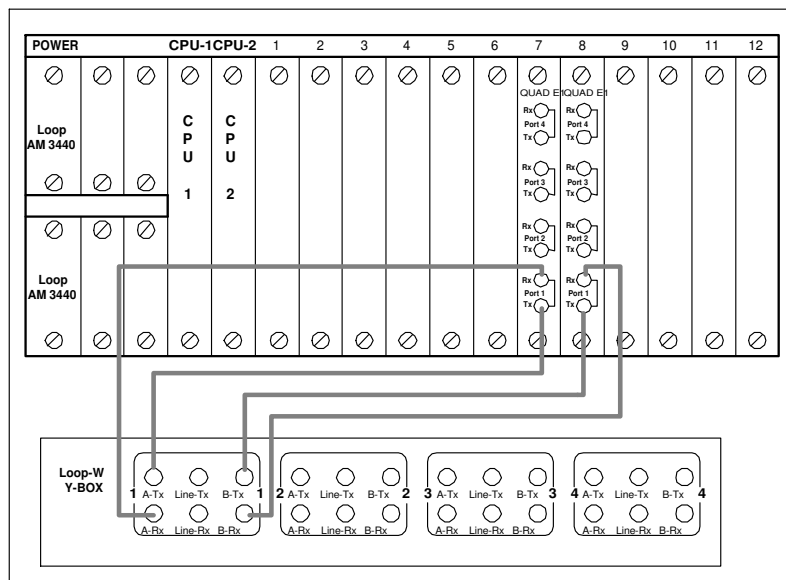


Figure 5-1 Connection for AM3440 and Y-BOX with BNC connectors

If you are using the RJ48C type Y BOX, connect it to the Loop-AM 3440 as shown in Figure 9-2 below. For illustration purposes, only Port 9 is protected in this sample diagram. To protect other ports you must connect them in a similar manner.

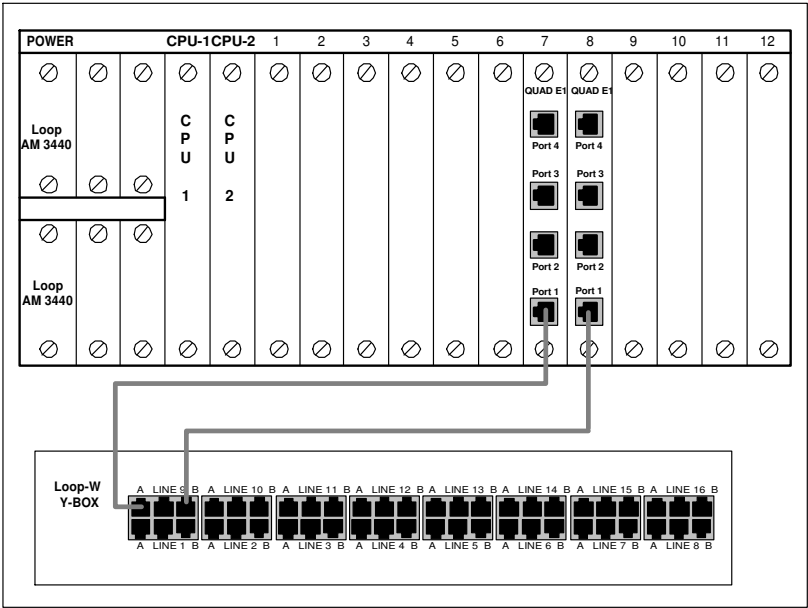


Figure 9- 1 Connection for AM3440 and Y-BOX with RJ48C connectors

NOTE: Cable connections between the RJ 48C connectors on the Y-Box and RJ48C connectors on the Loop-AM 3440 must be parallel, ie. Pin #1 → Pin #1, Pin #2→ Pin #2, Pin #4→ # 4, and Pin #5 → # 5.

4.3 Quad E1 card Location

In our sample setup we installed a Quad E1 card in Slot #7. We will use it as a Master. It will be the working line. We also installed a Quad E1 card in Slot #8. It will be used as a Slave and will perform the protection function.

4.4 Setting up a VT-100 Monitor

Use a DB9 cable to connect the front Console Port of the Loop-Am 3440 to either COM Port 1 or COM Port 2 of the PC you are using as a VT-100 monitor. It doesn't matter which Com Port you connect to.

NOTE: Many newer PCs use USB Ports. If your computer has a USB port rather than COM ports you will need to purchase a commercially available PC USB to DB9 conversion cable. These cables come with software which, when loaded in a PC, will allow you to send keyboard commands through the PC's USB Port to the DB9 Console Port of the Loop-AM 3440.

4.5 Step by Step Quad E1 Plug-in card Circuit Protection Setup

The sample screens below provide step by step instructions for setting up Quad E1Line Protection. In our sample setup we installed Quad E1 cards in slot #5 and slot #6. The card in slot #5 will be working slot, and slot 6 will be stand by.

From the Master Unit AM 3440-A Controller Setup screen press **Q** to set up QDS1 Protection.

```
LOOP AM3440-A                               === Controller Setup ===                11:31:39 06/14/2006

A -> System
S -> SNMP
B -> Password
C -> TSI map setup
D -> Select a new TSI map
E -> Copy a TSI map to another
F -> Clear a TSI map
L -> Command Line
I -> Init New Card
J -> Clear Empty Slot
G -> Link Backup Function
Q -> QDS1 1:1 Protection

<< Press ESC key to return to Main Menu or enter a command >>
```

The QDS1 Protection screen will appear. There are four selection for the user to setup such as disable, circuit, line-non revertive and line-revertive.

```
LOOP AM3440-A                               === QDS1 1:1 Protection ===                11:32:25 06/14/2006
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS
Protect Pair (Master:Backup)   Port 1      Port 2      Port 3      Port 4
=====
Slot A :B ( FOM:FOM ) -----
Slot C :D ( FT1:FE1 ) -----
Slot 1 :2 (      :      ) -----
Slot 3 :4 (GDSL-4:      ) -----
Slot 5 :6 (QuadE1:QuadE1) CIRCUIT DISABLE LINE-REV DISABLE
Slot 7 :8 (DTU-10:DTE-A ) -----
Slot 9 :10 (      :X.50 ) -----
Slot 11:12 (      :      ) -----

Protection Working Port      Port 1   Port 2   Port 3   Port 4
Slot A :B ( FOM:FOM )
Slot C :D ( FT1:FE1 )
Slot 1 :2 (      :      )
Slot 3 :4 (GDSL-4:      )
Slot 5 :6 (QuadE1:QuadE1)  N/A      N/A      5 -3    5 -4
Slot 7 :8 (DTU-10:DTE-A )
Slot 9 :10 (      :X.50 )
Slot 11:12 (      :      )
```

4.6 Setting Up Line Protection

Line protection is illustrated in Figure 9-1, below. It does not require the use of a Loop-VV Y-BOX.

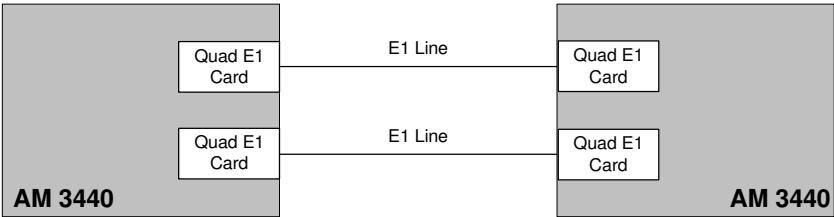


Figure 5-2 Line Protection for Quad E1 Card

4.7 Step by Step Quad E1 Card Line Protection Setup

The sample screens below provide step by step instructions for setting up Quad E1Line Protection. In our sample setup we installed Quad E1 cards in slot #5 and slot #6. The card in slot #5 will be working slot, and slot 6 will be stand by.

From the Master Unit AM 3440-A Controller Setup screen press **Q** to set up QDS1 Protection.

```

LOOP AM3440-A                               === Controller Setup ===                11:49:25 10/09/2009

A -> System
S -> SNMP Setup
B -> Password
C -> TSI Map Setup
D -> Select a New TSI Map
E -> Copy a TSI Map to Another
F -> Clear a TSI Map
L -> Command Line
I -> Init New Card
J -> Clear Empty Slot
G -> Link Backup Function
Q -> QDS1 1:1 Protection
K -> DS0-SNCP Setup
R -> PDH Ring Protection
T -> PDH Ring Diagnostic
N -> SNTP Setup
H -> TELNET/SSH Setup
P -> Power Setup

<< Press ESC key to return to Main Menu or enter a command >>

```

The QDS1 Protection screen will appear. There are four selection for the user to setup such as disable, circuit, line-non revertive and line-revertive.

```

LOOP AM3440-A                               === QDS1 1:1 Protection ===            11:32:25 06/14/2006
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS
Protect Pair(Master:Backup)   Port 1         Port 2         Port 3         Port 4
=====
Slot A :B ( FOM:FOM ) -----
Slot C :D ( FT1:FE1 ) -----
Slot 1 :2 (      :      ) -----
Slot 3 :4 (GDSL-4:      ) -----
Slot 5 :6 (QuadE1:QuadE1) DISABLE DISABLE LINE-REV LINE-REV
Slot 7 :8 (DTU-10:DTE-A ) -----
Slot 9 :10 (      :X.50 ) -----
Slot 11:12 (      :      ) -----

Protection Working Port      Port 1   Port 2   Port 3   Port 4
Slot A :B ( FOM:FOM )
Slot C :D ( FT1:FE1 )
Slot 1 :2 (      :      )
Slot 3 :4 (GDSL-4:      )
Slot 5 :6 (QuadE1:QuadE1)  N/A      N/A      5 -3    5 -4
Slot 7 :8 (DTU-10:DTE-A )
Slot 9 :10 (      :X.50 )
Slot 11:12 (      :      )

```

6 Appendix B- Alarm Model and Alarm Type

5.1 ccAlarmModel: Plug-in card model type

Table 6-1 Alarm Model Number

Card Type	Model Number	Card Description
18	quad-e1	4-channel E1
19	quad-t1	4-channel T1

5.2 ccAlarmType: Unit alarm

ccAlarmType for unit alarm has two formats: Vendor Spec and Assigned. Vendor Spec is the original format that displays only the alarm number. Assigned is the new format that displays the alarm type description. Select the format in V1: Trap Setup (Command Path: Main Menu> (S) System Setup >(S)SNMP Setup >(B)V1: Trap Setup). The alarm type on the SNMP screen will show in the format that you choose.

Table 6-2 Alarm Type Number for QE1 Card

Vendor Spec	Assigned	Alarm type
20	e1-rai(201)	RAI
21	e1-ais(202)	AIS
22	e1-los(203)	LOS
23	e1-lof(204)	LOF
24	e1-bpv(205)	BPV
25	e1-es (206)	ES
26	e1-uas(207)	UAS
27	e1-css(208)	CSS
28	ais-ins(209)	AIS-INSERT

Table 6-3 Alarm Type Number for QT1 Card

Vendor Spec	Assigned	Alarm type
20	t1-yel(221)	YEL
21	t1-ais(222)	AIS
22	t1-los(223)	LOS
23	t1-lof(224)	LOF
24	t1-bpv(225)	BPV
25	t1-es (226)	ES
26	t1-uas(227)	UAS
27	t1-css(228)	CSS

7 Appendix C: Port System Setup Configuration

7.1 Frame

For the E1 line interface:

The frame format is ITU G.704. Either 2-frame, or 16-frame can be selected and the frame structure goes with CRC setting. To use 2-frame structure, select ON for Frame and OFF for CRC. To use 16-frame structure, select ON for Frame and ON for CRC.

For the T1 line interface:

In ESF frame format mode, user can choose either AT&T or ANSI facility data link protocol. ESF & T1.403 chooses ANSI ESF data link protocol and one second performance report will be sent to the network every second automatically. Also, ANSI and AT&T data link message is acceptable in ANSI ESF frame format mode. However, AT&T ESF frame format mode only accepts AT&T ESF data link protocol.

T1 supports G.802 mode, called T1 FRAME NONE mode, which can only map to T1 same mode, or E1 port full channel map. E1 supports clear channel mode, called E1 FRAME OFF mode, which can map to E1 same mode or DTE port (full 32-channel map).

7.2 Code

For the E1 line interface, either AMI (Alternate Mark Inverting) or HDB3 (high density bipolar of length 3) line code format can be chosen. For the T1 line interface, either AMI (Alternate Mark Inverting) or B8ZS (bipolar with 8 zero substitution) line code format can be chosen. Be sure this setting matches that of the network.

7.3 RAI / YEL

Remote Alarm Indication (RAI), or Yellow alarm in T1 parlance (YEL), transmits a return signal back out to indicate loss of signal and loss of frame sync at the receiving side of the port. This action can be turned ON or OFF.

7.4 CRC

E1 can be used in two frame or multi-frame mode. Choose CRC OFF for 2-frame, and CRC ON for 16-frame. The cyclic redundancy check function can be turned ON or OFF. Unlike bipolar violation, which can monitor only one span, CRC allows error monitoring through multiple spans of DS0 lines. If CAS is ON, an 16-frame structure is used, which is independent of the 16-frame structure for CRC. A proprietary facility data link is implemented in both modes to facilitate remote system control and performance and statistics monitoring.

7.5 AIS

AIS, alarm indication signal, notifies the far end when one of the following conditions occur. One condition is when a loopback and diagnostic test are in progress. Thus customer signals are blocked. The other is when an alarm (LOS, LOF, AIS, RAI) occur on received site. The AIS can be sent two ways. In the framed mode, all time slots will have all ones sent but the framing pattern will be preserved. In the unframed mode, all ones are sent for all time slots.

When all ones are sent in both directions for a given port, due to the TSI (time slot interchange) within the Loop-AM4300, the corresponding time slots in other ports will also have all ones.

7.6 SIGNALLING

The signaling setup offers two options: TRAN and CD=01. TRAN (transparent) is to make no changes to the signaling bit. The testing device will use the same signaling bit it received for transmission. CD=01 to make changes the C and D signaling bit. For example, if the received signaling bit is 1011 (ABCD), choose CD=01 and the signaling bit will change to 1001.

7.7 CAS

For voice channels, the signaling information, which included such signals as on-hook, and ringing, can be carried by two methods. One is by a completely independent channel managed by the system operator, in which case no action is needed by the local equipment (CAS is OFF). Another is by CAS where the signaling information is carried in the same bit stream as the voice channel. In this second method, for time slot interchange, the signaling bits must be routed along with the voice channels to the proper destination. Thus the Loop-AM3440 must be told, when CAS is used, to turn the CAS option to ON.

For E1, CAS (Channel-Associated Signaling) is a method for sending signaling information where time slot 16 of the E1 format is shared for each of 30 other time slots within the same E1. OFF designation is for CAS disabled. For E1, when disabled, the 256N multiframe is used when time slot 16 is available to the user. The maximum number of time slots available for payload is 31. ON designation is for CAS enabled. When enabled, the 256S multiframe is used when time slot 16 is reserved for the transmission for end-to-end signaling using CAS. The maximum number of times slots available for payload is then 30.

For T1, CAS when ON is where "robbed-bit signaling" takes place. This places the signaling information, once every 6 frames, in bit 7 (least significant bit) of the associated time slot, replacing the information bit at that location. When CAS is OFF, robbed-bit signaling will not take place. When ON, robbed-bit signaling is permitted for voice channels. For channels designated as DATA, robbed-bit signaling is not performed.

7.8 Carrier Group Alarm

Carrier Group Alarm, CGA, is necessary for proper operation of the switched network in the face of possible faults of the transport system. In the "normal" option, when a carrier facility fails, the switching system must be notified so that it should cease to use that facility until repair is made. In the "transparent" option, the signaling bits are left alone in fault conditions.

7.9 OOS: Out of Service Signaling

For normal CGA option, when failure of the facility occurs, if there are calls in progress, the billing system should be notified to stop charging the customer at the time of facility failure. The Loop-AM3440 provides idle/busy/AIS sequences to suit the network needs. The signaling bit for BUSY is 1101, for IDLE is 0001, and for AIS is 1111.

7.10 Facility Data Link - In-Band Signaling

In all cases, Loop-AM3440 utilizes a proprietary facility data link, FDL for E1, or in-band signaling for T1, to achieve remote system control and performance and statistics monitoring.

7.11 Facility Data Link

For T1, the FDL (facility data link) is part of the ESF structure, for E1, this is not part of the standard. The Loop-AM3440 uses a proprietary FDL within the E1 frame structure to facilitate remote control and remote performance and statistics monitoring. This FDL, for E1 only, can be turned ON or OFF. The Sa-bit (Sa4-Sa8) can be set to select FDL channel. In the ITU G.704 specifications, within Time Slot 0 of the E1 format, five bits are designated as "National Bits." These bits can be used by each national networks as appropriate. These bits are called Sa4, Sa5, Sa 4+5, Sa6, Sa7, and Sa8. For the Loop products, Sa4 is the default bit for use as EOC (embedded operational channel) between any two Loop products. Using this channel, remote configuration commands and performance data are passed between the two units.

7.12 INTF (Interface)

The T1 interface can be long haul or short haul. Long haul has higher powered output to drive long lines, while short haul is more appropriate for intra-office connections. E1 interface only display 120 Ohm twisted pair or 75 Ohm coaxial cable, which is a manufacture option set by Jump. For detailed Jump setup, please refer to Chapter 2, Jumper Setting.

7.13 LBO (Line Build-Out)

For the T1 line long haul interface, the transmit LBO (line build-out) can be programmed to either 0 dB, -7.5 dB, or -15 dB.

For the T1 line short haul interface, the equalization can be set to equivalent cable distances up to 655 feet.

7.14 Idle Code

Any DS0 time slot, which is not assigned to a DTE port, is an idle time slot. An idle code is transmitted on idle DS0 time slots. The idle time slot may be programmed to any bit pattern from 0x00 to 0xFF. (The prefix 0x is to indicate that hex follows.)

NOTE: Due to ones-density requirement, it is advised that idle code to be set as 0xD5 for E1 and 0xFF for T1, which are the factory defaults. Otherwise, the idle code must be programmed to contain at least two bits of '1'.